Technical Report 448

AN INVESTIGATION OF THE ADOPTION PROCESS IN TRAINING TECHNOLOGY TRANSFER

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MANPOWER AND EDUCATIONAL SYSTEMS TECHNICAL AREA

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This study focused on the adoption process in the transfer of Army training technology from the researcher to the user. The training product chosen for this investigation was the Training Extension Course (TEC) program.

A two-part survey questionnaire was completed by 111 Army participants attending TRADOC/FORSCOM Training and Evaluation Workshops. The questionnaire requested attitudinal and usage information relating to the adoption of the -

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Training Extension Course (TEC) program by unit training managers. Sources of TEC-related information were matched with the awareness, acceptance, and utilization stages of the adoption process to help understand the dissemination activity within training technology transfer. The attitudinal responses were factor analyzed and, with selected biographic information, were entered in a regression analysis to assess the utility of these measures as predictor variables of TEC utilization.

Two major findings emerged. First, the acceptance (PERSUADE stage) of the TEC program is influenced predominantly by internal sources of information (e.g., work environment), while the initial awareness (INFORM stage) and later utilization of TEC are influenced by internal and external sources (support groups, briefings, etc.). Second, prior familiarity with TEC is a better predictor of TEC usage than are attitudinal measures taken from the innovation literature (for this particular sample). However, familiarity alone does not insure extensive TEC usage, since there is an approximate 50-50 split between TEC users and nonusers who are previously familiar with TEC. The majority of TEC users scheduled TEC less than 10% of their training time. The findings suggest that periodic scheduled TEC assessments might increase TEC use and that job performance data should continue to be collected for evaluating TEC utilization. Suggestions are provided to improve and evaluate TEC utilization.

This report is intended primarily for behavioral and social scientists interested in applying multivariate analytic techniques to the study of technology transfer.

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Training Technology

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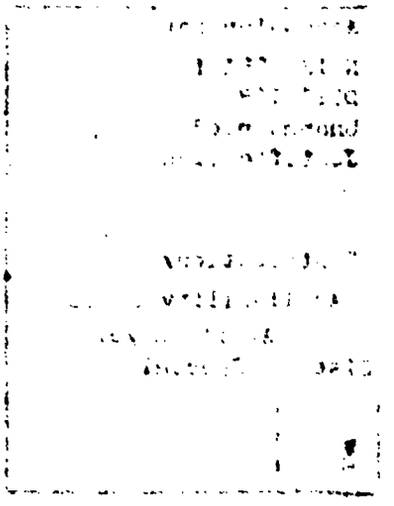
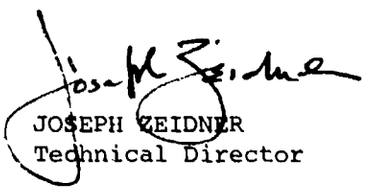


FOREWORD

The Manpower and Educational Systems Technical Area of the Army Research Institute for the Behavioral and Social Sciences (ARI) is concerned with improving individual and unit training through research in the design, methodology, and implementation of instructional delivery systems. One aspect of this research is to develop procedures for improving the acceptance and use of these training systems by Army personnel.

This report investigates the adoption process in the transfer of training technology from the researcher to the Army user. Work on this 6.2 effort was accomplished under Army Project 2Q162717A764, FY 1979, "Evaluation and Assessment of Training Technology."



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AN INVESTIGATION OF THE ADOPTION PROCESS IN TRAINING TECHNOLOGY TRANSFER

BRIEF

Requirement:

To investigate the influence of users' attitudes and sources of information on their adoption of a training research product.

Procedure:

A two-part questionnaire was administered to 111 Army participants attending TRADOC/FORSCOM Training and Evaluation Workshops. The questionnaire gathered information on attitudes and usage relating to the adoption of the Training Extension Course (TEC) program by unit training managers. Sources of TEC-related information were matched with the awareness, acceptance, and utilization stages of the adoption process to gain an understanding of the dissemination activity within training technology transfer.

Findings:

Two major findings emerged. First, the acceptance (PERSUADE stage) of the TEC program is influenced primarily by internal sources of information (e.g., work environment), while the initial awareness (INFORM stage) and later utilization of TEC are influenced by internal and external sources (e.g., support groups, briefings). Second, prior familiarity with TEC predicted TEC usage better than did attitudinal measures, for this particular group. However, familiarity alone does not insure extensive TEC usage, since about half of those previously familiar with TEC did not use it. The majority of TEC users scheduled TEC less than 10% of their training time.

Utilization of Findings:

The sources of information contributing to the awareness and later utilization of TEC originated both within and outside the unit. However, TEC acceptance (i.e., the decision to use TEC) was influenced significantly more by sources of information within the unit. Far more people were aware of TEC than accepted and used it. The findings suggest that although awareness is influential, acceptance is relatively critical for TEC adoption. Therefore, efforts could be directed toward (a) recognizing that the unit is the primary decision point influencing acceptance of TEC and (b) providing updated and relevant information to key unit training personnel to insure a self-renewal capability that would direct the integration, adaptation, and modification of TEC from within the unit. Application of this approach may provide a reliable dissemination activity for improving product utilization in Army training technology transfer.

AN INVESTIGATION OF THE ADOPTION PROCESS IN TRAINING TECHNOLOGY TRANSFER

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AN INVESTIGATION OF THE ADOPTION PROCESS IN TRAINING TECHNOLOGY TRANSFER

INTRODUCTION

There is a present concern that a significant number of recently fielded Army training products have not been integrated sufficiently nor used effectively to improve individual and unit proficiency within the Army's materiel systems (Freda, 1980; Sands & Glaser, 1978; Shields, 1976). This concern can be viewed as an acceptance and usage problem in the transfer of new training technology from the researcher to the user. Focus on the training technology transfer process is based on the assumption that the strategies and procedures used to formulate and introduce new training technology in the field are primary determinants of the acceptance and use of the training products.

In addressing this problem, a systems model of Army training technology transfer has been developed to define the sequential flow of activities involved in the process (Freda, 1980). The activities in the model are (a) analysis of requirements (e.g., needs assessment, results in a researchable question); (b) research, develop, test, and evaluate solutions (e.g., research, test, develop, and evaluate [RDTE]; results in a research product), (c) dissemination of findings (can result in user acceptance); and (d) institutionalization (starts with the utilization of the product by the user and eventually is incorporated within the user's agency as part of standard practice) (see Figure 1 and Table 1).

The purpose of this model was to (a) document relevant Army regulations within the appropriate activities of the model, (b) provide an information base for use by Army decisionmakers to improve the process where needed, and (c) discuss suggestions for tracking product utilization. Within the framework of this model, a major issue is the lack of data on how dissemination efforts can be guided to insure the institutionalization of a training product. Specifically, critical concern is focused on variables that contribute to the user's adoption of a training product. The adoption process occurs during, and between, the dissemination of information of a training product and the institutionalization of the training product (initial utilization; see Figure 2).

A myriad of variables has been addressed in an effort to understand the adoption process (see Table 2). The variables researched in the present study are derived from two major questions. First, do users of training products possess attitudes different from those who do not use training products? For example, in a study of attitudinal differences between users and nonusers of computer-assisted instruction (CAI), Pengov (1977) found that CAI users had significantly more positive attitudes toward computers in general and more familiarity with educational innovations than did non-CAI users. The relevance of this research question to Army training technology transfer is that knowledge of user attitudinal variables may help to focus dissemination efforts on those potential users possessing attitudes similar to previous users of training products. Knowing on whom to focus one's efforts, then, may result in a reduction of the time-lag between RDTE and utilization, as well as a significant improvement in product utilization.

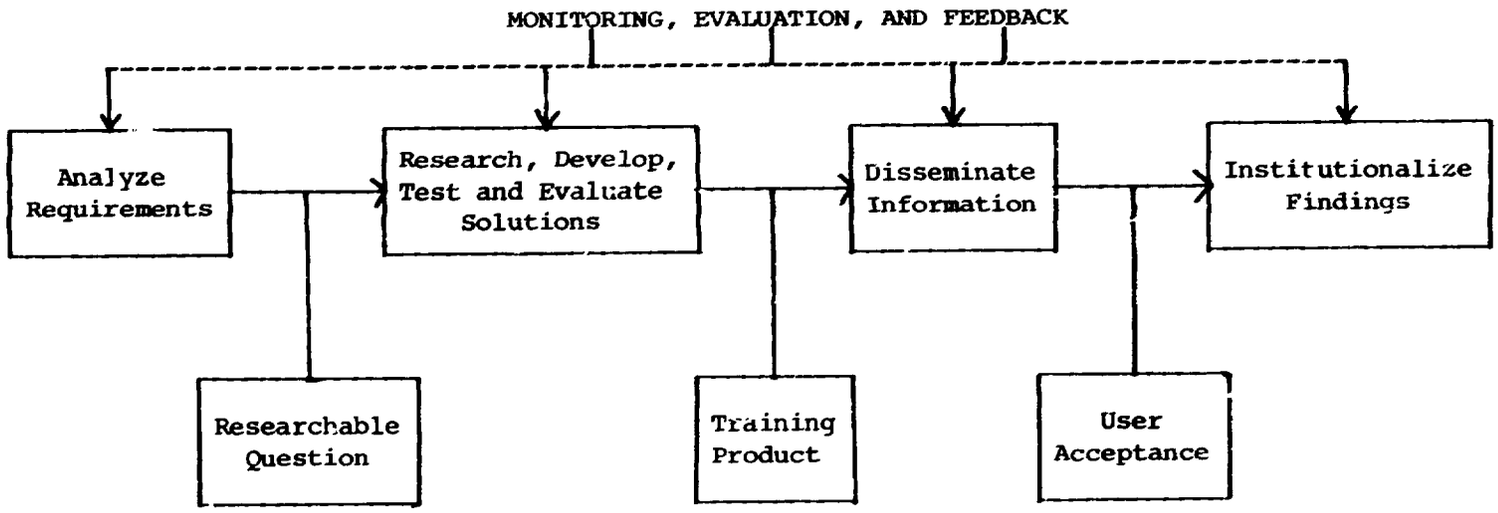

Figure 1. Army training technology transfer model.

Table 1

Description and Keywords of Each Activity in the Model

Activity	Description	Keywords
Analyze Requirements	A systematic effort by the researcher and the user to determine the goals, objectives, or alternatives for the basis of a productive effort at applied research technical assistance or organizational improvement (Hambrick, 1978). Requirements analysis may be viewed as a discrepancy analysis between "what is" (current condition; baseline activity level) and "what should be" (required or desired condition). A problem may then be defined as a documented discrepancy selected for resolution (Kaufman, 1972). Techniques to assess requirements must yield information that attempts to represent the two polar conditions of "what is" and "what should be." The result of a researcher-user requirements analysis is a researchable question, directed by the user's needs and adapted technically by the researcher's experience.	Baseline Discrimination Definition Phase Discrepancy Analysis Forecasting Needs Analysis/Assessment/ Identification Organizational Diagnosis Planning Stage Problem Analysis/Definition/Diagnosis/ Identification Program Analysis/ Formulation Project Formulation Social & Behavioral Indicators
Research, Test, Develop, and Evaluate (RDTE) Solutions	A systematic effort to establish a scientific knowledge base (6.1) for potential solutions to specific military problem areas (6.2), and to apply this knowledge in solving a researchable question directed, in part, by a military sponsor's need and/or directive (6.3A). The procedures describing Army HR RDTE are the most documented (by regulation and doctrine) relative to the other activities in the model. The end result of this activity is a training product which satisfies a sponsor's requirement.	Applied Research[a] Assessment of Casualty Basic Research[b] Design, Development Factor Identification/ Manipulation Innovation/Invention Stage Technology Application/ Utilization Prototype Model/Breadboard Mockup Variable Relationships Field Testing and Evaluation Validation and Feedback

Table 1 (Continued)

Activity	Description	Keywords
Disseminate Information	The dispensation of information about RDTE products to users at various distances from the points of origin of the R&D product (Shields, 1976). For example, an ARI scientist can relay information about a particular training product to the military sponsor who originally requested a need for the product. In this case, the ARI scientist describes the product designed in response to the user's need, demonstrates its operation, provides assistance in training "front-line" users to operate the product, and turns over the whole package to the user for their own purposes. On a broader scale, the ARI scientist can inform other units, commands, agencies, etc. about this product, thereby diffusing the findings to other potential users more remote from the initial application of the training product. Individuals who promote the acceptance of the training product into their/other organization(s) are called Change Agents or Linkage Agents, and the process whereby disseminated findings are convincingly demonstrated to, and by, the Change Agents (and other users) is called Linkage or Change Agentry. Indicators of the dissemination of information to the user are observed in (a) professional publications, technical reports, briefings, and meetings with the sponsor/user; and (b) use of the Army Research and Development Information System (ARDIS) via its two subsystems: the Management Information System (ARDIS-MIS, which provides management type information to DCSRDA and information and guidance to ODCSRDA and other Army R&D managers); and the Scientific and Technical Information Program (S&TI, which is supported by the DDC data bank). The end result of this activity is the user's acceptance of the training product.	Change Agentry Communication Confirmation Decision Demonstration Diffusion Exchange/Feedback Flow of Information Knowledge Flow Linkage Reception/Rejection Retrieval/Memory Bank Transmission

Table 1 (Continued)

Activity	Description	Keywords
Institutionalize the Findings	After user acceptance, it is the time period during which the training product is incorporated and used effectively by the Army user. Ultimately, the training product becomes a stable and regular part of Army organizational procedures and user behavior.	Adaption Adoption Application Assimilation Diffusion Distribution Implementation Policy Routinization Utilization
Monitoring, Evaluation and Feedback	A systematic effort to monitor and evaluate the technology transfer process of a training product and to provide feedback to the researcher and user concerning changes and new requirements in the formulation and introduction of current and subsequent training technology.	Assessing the Level of Product Use Evaluation Study Implementation Study Predictive Model of Technology Transfer Project Monitoring Program Evaluation

[a]Also known as commission-initiated research, contract-supported research, directed-research, mission-oriented research, payoff research, targeted research, research in the service of man, technology.

[b]Also known as contracted/grant research, fundamental research, nontargeted research, undirected research, science research.

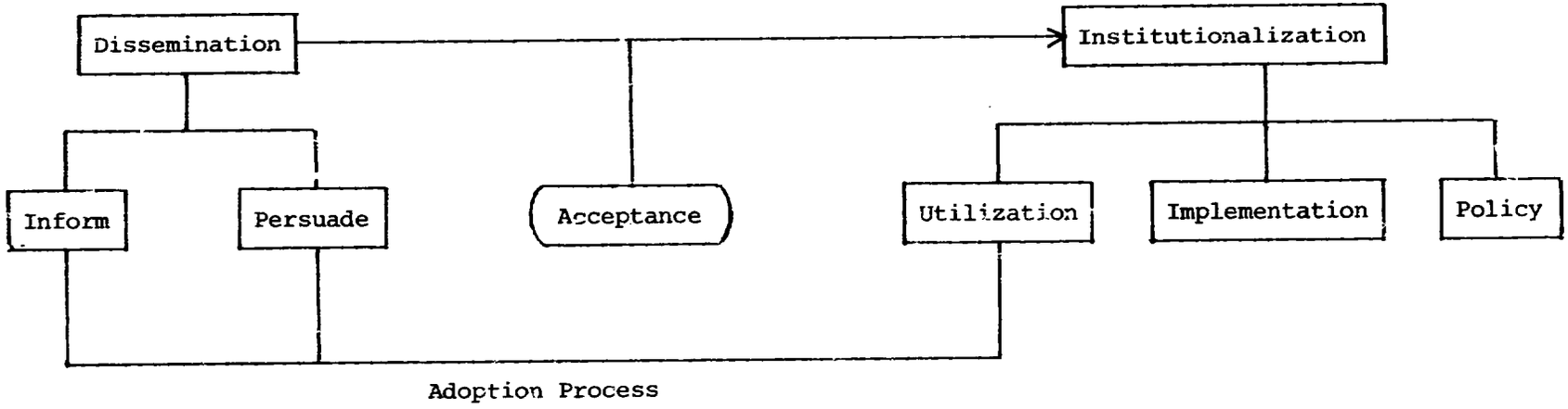

Figure 2. The adoption process in technology transfer.

Table 2

Factors Influencing the Likelihood of Adoption or Adaptation of a Seemingly Promising Innovation by an Organization: Integrated Findings

E. Davis (8 factors)	E. M. Glaser (20 factors)	G. Zaltman et al. (condensation of 19 factors)	R. Havelock et al. (10 factors)
Ability to carry out the change	Capability and resources	Financial and social costs	Structuring Capacity
Values or self-expectancy	Compatibility	Compatibility Publicness vs. privateness Impact on interpersonal relations	Homophily Empathy
Idea or information about the qualities of the innovation	Credibility Ease in understanding and installation Observability Trialability Divisibility Reversibility	Communicability Divisibility Reversibility Complexity of concept or implementation Susceptibility to successive modifications Scientific status Point of origin Terminality	Openness
Circumstances which prevail at the time	Willingness to entertain challenge A climate of trust Structural reorganization		Proximity
Timing or readiness for consideration of the idea	Sensitivity to context factors Early involvement of potential users Suitable timing		Linkage Synergy

Table 2 (Continued)

H. Davis (8 factors)	E. M. Glaser (20 factors)	G. Zaltman et al. (condensation of 19 factors)	R. Havelock et al. (10 factors)
Obligation, or felt need to deal with a particular problem	Relevance Widespread felt need to correct undesirable conditions Shared interest in solving recognized problems	Degree of commitment	Energy
Resistance or inhibiting factors	Skill in working through resistances	Risk or uncertainty of various kinds Number of gatekeepers or approval channels	
Yield, or perceived prospect of payoff for adoption	Relative advantage An incentive system	Efficiency of innovation Perceived relative advantage Gateway to other innovations	Reward

Source. Davis and Glaser (1976).

The second question is concerned with knowing what sources of information are used by potential users during the adoption process. Sources of information are representative of types of authority. Studies conducted by Fairweather (1967, 1971, 1973, 1974) and Davis (1972) suggest that potential users are influenced by different types of authority during different stages of the adoption process. Specifically these studies have shown that external sources of information (i.e., originating outside the work environment of the user) influence the user's familiarity and subsequent utilization of a research product. However, internal sources of information (i.e., originating within the work environment of the user) appear to influence decisions to accept the research product (Fairweather, 1974). With respect to Army training technology transfer, if the potential user's reliance on different sources of information is related to different stages of the adoption process, then future dissemination efforts could be guided by the stages of the adoption process. Knowing what sources of information to introduce at each stage of the adoption process may improve the probability of user acceptance and utilization of the training product.

Accordingly, the purpose of this paper is to investigate both subjective (attitudinal) and objective (sources of information) variables that may influence the adoption of an Army training product. The training product chosen for study was the Training Extension Course (TEC). The Army's program consists of performance-oriented, self-paced lessons (mainly audiovisual) prepared by service schools to provide individual instruction for enlisted men in Army units. The TEC program was initiated by the U.S. Army Combat Arms Training Board in response to a 1971 Army directive to decentralize training management at battalion levels and below. Since that time, the TEC program has passed through various stages of development and evaluation. A current evaluation concerns the use of TEC (Mays, Holmgren, & Shelnutt, 1979).

A number of studies have investigated various aspects of the TEC program, including cost-effectiveness analysis of TEC (Temkin, Connolly, Marvin, Valdes, & Caviness, 1975); TEC training effectiveness compared with conventional Army classroom instruction (Knerr, Downey, & Kessler, 1975); TEC delivery via CAI (Hoyt, Bennik, & Butler, 1977); and effects on retention from TEC training compared with effects from conventional instruction and from Lesson Administrative Instructions (Holmgren, Hilligoss, Swezey, & Eakins, 1979). With respect to TEC utilization, two studies have been reported.

In a survey of selected active and reserve component units, McCluskey and Tripp (1975) found that (a) command emphasis did not affect the mode of use for TEC, (b) approximately 30% of the soldiers surveyed used TEC, (c) the major reason cited by the respondents for not using TEC was the lack of prior awareness about TEC, and (d) unit training officers and noncommissioned officers (NCOs) reported positive attitudes with respect to the content and utility of TEC. Based on the results of this study, some of the suggestions offered by the authors for improving TEC use were an increased role of the TEC learning centers; promotional, prototypic training programs for demonstrating TEC; and establishment of an incentive system to improve TEC use.

Mays, Holmgren, and Shelnutt (1979) conducted a two-phase survey of active and reserve component battalions within the Continental United States (CONUS), and battalion level personnel in U.S. Army, Europe (USAREUR) to

obtain TEC utilization data. In the first phase, Mays et al. (1979) found that the reserve component used TEC more often than did the active component (i.e., 49,103 vs. 14,722 individual TEC uses); TEC usage in the active component was predominantly in an individual-mode, while that in the reserve component was in the group (<6) mode; and for both components, the TEC use rate per battalion was highest for infantry and lowest for field artillery. This last finding is partially explained by the lack of MOS-specific TEC lesson series and the inapplicability of common TEC lesson series to field artillery than to infantry at the time the study was conducted. Some of the findings from the second phase of their study were that lack of awareness of TEC contributed to the number of TEC nonusers, command promotion of TEC was low or moderate, and unit trainers influenced significantly the use of TEC. Thus, the general consensus of the findings of these two studies is that significant improvement could be realized in the effective use of the TEC program.

As indicated by Mays et al. (1979), lack of awareness and low command emphasis may be relevant variables contributing to ineffective TEC use. This hypothesis could be related to the timing of dissemination efforts (in the form of sources of information) in relation to the stages of the adoption process. That is, the types of authority upon which one will rely to decide to use TEC may depend on the existing stage of the adoption process. Moreover, the attitudes of TEC users and nonusers may be used to predict, in an ex post facto fashion, the extent of TEC use. This predictive approach will assess the reliability of the relationship between attitudinal measures of users and product utilization.

The present study differs from previous research on TEC utilization in that a systems model of Army training technology transfer (Figure 1) is used to organize data collection on the adoption process of a training product. The research undertaken here assumes that an increased understanding of (a) user attitudes toward training products, the organizational system, and personal characteristics, and (b) sources of information used during the adoption process will provide information for Army research and development training managers who wish to introduce and use TEC in their units. Moreover, this study will provide data concerning the utility of a systems approach to predicting and understanding product utilization.

METHOD

Sample

A two-part survey questionnaire (Appendix) was completed by 111 Army (all active components) participants attending the TRADOC/FORSCOM Training and Evaluation Workshops conducted during August and September 1976. Table 3 presents a breakdown of the location of the participants, and Table 4 presents the sample breakdown of their background information. These data indicate that most participants were majors and captains assigned to S-3 duty within Field Artillery or Infantry. Most had been assigned temporary duty no more than once a year, and had fewer than two prior training-related assignments.

Table 3

Respondent Location

Location	Number of respondents	Percent
Fort Sill, Okla.	22	19.8
Fort Hood, Tex.	20	18.0
Panama	12	10.8
Fort Benning, Ga.	11	9.0
Fort Lewis, Wash.	8	7.2
Fort Bragg, N.C.	7	6.3
Fort Carson, Colo.	5	4.5
Fort Ord, Calif.	4	3.6
Panama (School of America)	4	3.6
Fort Polk, La.	4	3.6
Fort Richardson, Alaska	4	3.6
Fort Campbell, Ky.	3	2.7
Fort Knox, Ky.	3	2.7
Fort Stewart, Ga.	2	1.8
Germany	1	0.9
Korea	1	0.9
Total	111	100.0

Table 4

Respondent Characteristics

Background variable	Number of persons (N = 111)	Percentage
Rank		
LTC	5	4.5
MAJ	36	32.4
CPT	48	43.2
1LT	6	5.4
2LT	2	1.8
NCO	14	12.6
Current job assignment		
G-3	7	6.3
S-3	67	60.4
School	4	3.6
Training Officer/NCO	12	10.8
Other	21	18.9
Branch		
Armor	10	9.0
Engineer	8	7.2
Field Artillery	34	30.6
Infantry	37	33.3
Other	22	19.8
Frequency of TDY		
Never	26	23.4
Annually	42	37.8
Biannual-Qtrly	23	20.7
Monthly	12	10.8
No response	8	7.2
Military schools attended		
0	2	1.8
No response	3	2.7
1-2	43	38.7
5-10	26	23.4
Previous training assignments		
0	19	17.1
1-2	57	51.4
3-4	21	18.9
5-7	5	4.5
No response	9	8.1

Data Collection Form

The first section of the two-part questionnaire requested bibliographic information and presented 15 questions on communication patterns and use of TEC in the respondent's unit training program. Primary interest in this section was on three questions used to elicit the sources of information relied upon by the respondents during each stage of the adoption process (see Table 5). The second section of the questionnaire presented 23 items designed to assess the respondents' attitudes toward individual/personal characteristics, social system features, and innovation/research products. Attitudes toward these three major construct variables and their subcomponents have been reported to influence the adoption of research products (Davis & Glaser, 1976; Havelock, 1976; Pengov, 1977). These construct variables and their respective concept sources are presented in Table 6. Respondents rated each of the 23 topics on 10 bipolar adjective scales based on the format of the Osgood Semantic Differential (Osgood & Suci, 1955). Prior to data analysis, the 23 topics were arranged in accord with the construct variables.

Table 5

Questions Related to Stages of the Adoption Process

Question	Stage
1. From what source did you first learn of the TEC lessons?	INFORM
2. What source of information convinced you to use TEC?	PERSUADE
3. From what source of information did you learn how to use TEC?	UTILIZATION

Procedure

TEC usage data collection forms and instructions for completion were given to each participant in the TRADOC/FORSCOM Training and Evaluation Workshop. The participants' responses for the two-part questionnaire were transcribed onto coding sheets and punch-card coded for subsequent data analysis via the Statistical Package for the Social Sciences (Nie, Hull, Jenkings, Steinbrenner, & Bent, 1975).

Missing values on items in the first section of the questionnaire were not included in the data analysis. To facilitate data reduction in the second section of the questionnaire, one score for each item was computed by summing across the bipolar adjective scales, which have been reported to load greater than or equal to .75 on an evaluative dimension (e.g., Osgood & Suci,

Table 6

Construct Variables Linked to Section II Questionnaire Items and Concept Source

Construct variable	Total items	Item number	Concept source
Individual			
Professional Self-Esteem	2	5, 8	Havelock, 1976
Social System			
Leadership Behavior	6	11-16	Likert, 1967
Social Interaction	1	6	Havelock, 1976
Influence Unit Policy	1	7	Havelock, 1976
Support	1	22	Alderman & Mahler, 1976
Innovation			
Software Specific	4	1, 3, 19, 20	Havelock, 1976
Hardware Specific	2	2, 10	Havelock, 1976
Software General	1	4	Havelock, 1976
General Issues	3	9, 17, 18	Havelock, 1976
Cost-Benefit	1	21	Fliegel & Kivlin, 1966
Degree of Change	1	23	Fliegel & Kivlin, 1966

Note. The analytical and research approach of this research is based on the methodology and research of Pengov (1977).

1955; Shaw & Wright, 1967). This procedure resulted in an item score based on five scales: good-bad, honest-dishonest, fair-unfair, pleasant-unpleasant, and valuable-worthless. Missing values on each of these scales were managed in the following manner: (a) if one out of five scales was not marked, that scale was assigned a median value [4]; and (b) if two or more of the five scales were not marked, the summed score was replaced by the within-subject mean obtained from the summed scales across the individual's completed item scores. This procedure was used to minimize spurious correlations due to unequal number of observations.

The information obtained in the first section of the questionnaire was subjected to a contingency analysis and a descriptive histogram breakdown. The item scores in the second section on the questionnaire were factor analyzed, converted to summed factor scores, and together with selected variables from the first section, entered into a regression analysis to assess the utility of those attitudinal measures as predictor variables.

RESULTS

TEC-Related Information

Table 7 presents the source of information used during the adoption process. Statistical analysis of the number of respondents who used the different sources of information revealed that certain sources of information were relied upon significantly more than other sources between and within the stages of the adoption process (X^2 (8) = 38.35, $p < .001$). Post hoc comparisons among the proportions (all significant z's > 1.96, p's < .05) of respondents using each source of information by each stage of the adoption process (a between-cell analysis of Table 7) indicated that (a) respondents relied on TEC information presented within the work environment and from the published literature and text material to the same extent across each stage of the adoption process; (b) reliance upon information from the training support groups and briefings was significantly greater during the initial informative (awareness) and later utilization stages than during the middle acceptance stage of the adoption of TEC within the unit; and (c) reliance upon formal schools for information was greater during the initial awareness than during the subsequent acceptance and utilization of TEC lessons.

Table 8 presents the sample breakdown of TEC utilization information. The data show that among those respondents previously familiar with TEC (FAMTEC), 46% were TEC users, whereas 21% of the respondents were not familiar with TEC. Moreover, approximately half of the TEC users schedule TEC for less than 10% of their training time. FAMTEC as well as selected background variables were entered into later regression analyses to assess the relative importance of these variables in predicting TEC utilization (TECUSE).

Factor Analysis

The initial concern with the 23 scale items in the second part of the questionnaire was focused on the relationship among the scales and their extent of agreement with the a priori categorization based on the construct variables from innovation literature. Table 9 presents the mean rating and

Table 7

Sources of TEC Information Relied Upon by Respondents[a] for Each Stage of the Adoption Process
(Data Combined for Captains and Majors; N = 84)

Sources of information	Stages: INFORM[b] — Survey question: "From what source of information did you first learn of the TEC lessons?"		Stages: PERSUADE[c] — Survey question: "What source of information convinced you to use TEC?"		Stages: UTILIZE[c] — Survey question: "From what source of information did you learn how to use TEC?"	
	Number[d]	Relative %	Number[d]	Relative %	Number[d]	Relative %
Work environment	23	27.4	25	29.8	19	22.6
Training support groups & briefings	22	26.2	5	6.0	14	16.7
Formal schools	16	19.1	5	6.0	4	4.8
Published literature and text material	10	12.0	9	10.7	13	15.5

[a] Indicates relative number and percentage of respondents who answered the three questions.

[b] Includes TEC users and nonusers.

[c] Includes only TEC users.

[d] More than one source of information could have been reported by each respondent.

Table 8

Sample Breakdown of TEC Utilization Information

TEC-related variables		TEC users (N = 44)	Non-TEC users (N = 67)
Familiar with TEC	YES	44	46
	NO	0	21
Percent training time used for TEC	0	10	67
	1-9	21	0
	10-29	9	0
	30-100	4	0

Table 9

Mean Ratings and Standard Deviations of Respondents by Item Number in Section II of the Questionnaire

Item number	Construct variable	Mean	Standard deviation
1	Innovation	27.4	6.8
2	Innovation	27.1	6.5
3	Innovation	28.0	6.7
4	Innovation	29.4	6.8
5	Individual	29.1	7.3
6	Social System	28.6	7.3
7	Social System	25.9	7.1
8	Individual	27.0	6.6
9	Innovation	19.5	6.8
10	Innovation	25.7	7.1
11	Social System	28.6	7.4
12	Social System	29.6	7.2
13	Social System	30.1	6.9
14	Social System	29.4	7.1
15	Social System	28.9	7.2
16	Social System	28.4	7.3
17	Innovation	23.6	7.4
18	Innovation	25.2	7.6
19	Innovation	26.4	7.3
20	Innovation	25.8	6.5
21	Innovation	27.0	6.8
22	Social System	24.8	7.0
23	Innovation	20.6	9.1

Note. Scale Anchor Points: Highest evaluation = 35; middle evaluation = 20; lowest evaluation = 5.

standard deviations of each item across subjects. Split-half, odd-even reliability (Rulon, 1967) was computed to be .80, thus indicating good internal consistency among the items of the scale. Correlations among the items were then computed, and the resulting intercorrelation matrix was subjected to a Principal Components Factor Analysis with varimax rotation. A principal components solution was obtained in which unity (1) was placed in the diagonal of the intercorrelation matrix, and a minimum eigenvalue of 1 was used for the criterion of factor extraction. Results from the first pass showed that 14 factors had eigenvalues greater than 1, which accounted for 95.9% of the cumulative variance.

Subsequent passes were conducted on the 23 items, which were orthogonally varimax rotated on three through eight factors, respectively. Analysis of these subsequent passes indicated that five factors provided the optimum data reduction with respect to interpretive sense, minimum eigenvalue criterion, spread of item loadings, and maximum accounting of the variance.

Table 10 presents a breakdown of the varimax rotated factor loading matrix of item number and content by factor number and name. The results indicated that the a priori constructs of individual and social system variables were collapsed across an interpersonal dimension in this analysis, while the innovation variable retained its independence (although scattered into three variables) from the other two categories. Factor scores (Table 11) were then computed by summing across the time scores that loaded the heaviest within each factor (Nunnally, 1967). The factor scores were considered to be representative of the respective construct variable for this particular sample and were used in the subsequent regression analysis as a predictor variable of TEC utilization.

Regression Analysis

A foward-stepwise multiple regression analysis was performed that entered as first into the regression equation that variable which explained the greatest amount of variance in the outcome variable. Classification of the predictor variables was based on the factor scores mentioned previously, as well as on the background and FAMTEC variables. TECUSE served as the outcome variable.

The only variable that entered significantly in the regression equation was FAMTEC. Further analyses yielded other variables which entered but not significantly. These variables each incremented the multiple R by at least 2% in predicting TECUSE; number of previous major military schools attended (School); present job assignment (Job); Army Branch (Branch); perceived attitude toward group lecture method (Factor 5); perceived degree of change (Factor 4); and perceived attitude toward training innovations (Factor 2). Table 12 shows the number of questionnaire items that must be added to obtain each variable along with the multiple R and percentage of the variance explained by each variable.

The findings indicate that given all construct variables, only prior familiarity with TEC (FAMTEC) is the most efficient and the only significant predictor of TEC use. Using only FAMTEC, the predictor equation that accounts for 12.7% of the variance is

Table 10

Rating Factors for Respondents by Item and Loadings[a]
(Total variance accounted for = 80.7%)

Factor I Interpersonal 66.1%[b]		Factor II Training innovations 4.6%		Factor III General issues 3.9%		Factor IV Degree of change 3.2%		Factor V Lecture 2.9%	
Item	Loading	Item	Loading	Item	Loading	Item	Loading	Item	Loading
5	.69	1	.75	17	.68	23	.92	9	.90
6	.62	2	.70	18	.77				
7	.72	3	.65						
8	.73	4	.72						
11	.74	10	.71						
12	.74	19	.64						
13	.76	20	.73						
14	.82	21	.56						
15	.83	22	.63						
16	.82								

[a]Factor inclusion criteria: Communality ≥ .45; Loading ≥ .55.

[b]Variance accounted for by each factor.

Table 11

Mean Factor Scores for Respondents Based on the Sum of Item Scores Within Each Factor

Factor name	Mean factor score	Standard deviation
I. Interpersonal	285.9	64.1
II. Training innovations	241.6	52.0
III. General issues	48.9	13.3
IV. Degree of change	20.6	9.1
V. Lecture	19.5	6.8

Table 12

Number of Questionnaire Items Required for Predictor Variables Compared with the Amount of Variance Explained

Construct variable	Number of questionnaire items used	Cumulative number of questionnaire items	Percentage of variance explained	Cumulative percent of variance explained
FAMTEC[a]	1	1	12.7	12.7
Factor 2	9	10	3.0	15.0
Factor 4	1	11	2.8	17.8
Branch	1	12	1.2	19.0
School	1	13	1.1	20.1
Job	1	14	1.0	21.0
Factor 5	1	15	0.8	21.8

[a] $F(1, 98) = 14.3$, $p < .001$.

$$TECUSE = 1.92 - .44\ (FAMTEC).$$

Using all seven variables, the equation that accounts for 21.8% of the variance becomes

$$TECUSE = 2.14 - .45\ (FAMTEC) - .01\ (Factor\ 4) - .08\ (School)$$
$$- .01\ (Job + .02\ (Branch) - .02\ (Factor\ 5) + .003\ (Factor\ 2).$$

One point of caution must be made with respect to the regression equations. The mix of variables, coefficients, and constants in the equations as shown have been maximized for a particular sample under study. One should expect slippage of predictability if the equations are used with other populations (Darlington, 1978; Winer, 1978). Furthermore, even though the analysis thus far has suggested a minimal set of construct variables for TEC users and non-TEC users, there is no guarantee that a new instrument using only these measurement variables would produce the same results. Such a study should be tried, but the individual, social system, and innovation variables should be expanded and included.

DISCUSSION

Findings

Two major findings emerged from this study. First, the acceptance (PERSUADE stage) of the TEC program is influenced predominantly by internal sources of information (e.g., work environment), while the initial awareness (INFORM stage) and later utilization of TEC are influenced by internal and external sources of information (e.g., support groups, briefings, etc.). This finding supports the data of Mays et al. (1979), who found that 74% of the soldiers surveyed learned to accept TEC from their unit trainers.

Second is that prior familiarity with TEC is a better predictor of TEC usage than are attitudinal measures taken from the innovation literature (for this particular sample). However, familiarity alone does not insure extensive TEC usage, since there is an approximate 50-50 split between TEC users and nonusers who are previously familiar with TEC. In addition, most TEC users in the present study scheduled TEC less than 10% of their training time. This second finding is similar to the 50.2% of respondents being TEC users as reported by Mays et al. (1979). Moreover, this finding suggests that remedy of the lack of awareness of TEC reported in McCluskey and Tripp (1975) would not lead necessarily to TEC utilization. The two major findings are discussed in detail below.

1. Attitudinal Measures and TEC Familiarity. Specifically, the interpersonal dimension found in this study is a composite of two separate dimensions obtained a priori from the literature. The fact that an interpersonal dimension was found is partly due to the lack of items that could have discriminated between a separate individual and social system variable. Attitudes toward training innovations were clustered generally around one factor, although three other factors were observed that evidently were not perceived similarly in terms of training innovations by the respondents.

Thus, these findings suggest that attitudinal measures of the adoption process with respect to interpersonal and training appear to cluster similarly across laboratory studies, although these measures may not be significant for prediction purposes. That is, the relative importance of indices sampled in this study weights an individual's prior familiarity with TEC as the only significant predictor of TEC utilization.

Support for this finding comes from Pengov (197 , who observed that prior familiarity with educational innovation was the single most effective predictor of computer-assisted instruction (CAI) usage among her respondents, accounting for approximately 18% of the variance. Similarly, in the present study prior familiarity with TEC was the only significant predictor of TEC usage, accounting for approximately 13% of the variance of the respondents' answers.

2. Sources of Information. The sources of information change with the stages of the adoption process. It appears that the proximity of the source of the information is valued as the time approaches to commit oneself to accept/refuse the training product. TEC users relied more on within-unit information to decide to accept TEC. This finding, together with familiarity alone not insuring TEC use, indicates that the potential user's selection of authoritative sources of TEC changed over time during the adoption process. Thus, dissemination efforts could synchronize and adapt TEC-related information with the potential user's bias toward the authoritative source relied upon during the particular stage of the adoption process.

Suggestions

Suggestions based on these results depend upon the primary objective of Army training and its subsequent measures of effectiveness, costs, and benefits. If the objective is to improve unit or individual proficiency in Army personnel by providing a self-paced, decentralized, managed training system, then agreement must be made on measures of effectiveness that evaluate the system. TEC use has been a primary measure of effectiveness to evaluate the TEC program. Previous research has reported a significant relationship between TEC lesson use and MOS test performance (e.g., Jacobs & Hardy, 1974; Knerr, Downey, & Kessler, 1975). Moreover, an increase in TEC use has been reported to be related to more cost-effective training (Temkin, Connolly, Marvin, Valdes, & Caviness, 1975). Therefore, based on these past results and findings of the present study, two suggestions are provided to improve TEC use (assuming that this activity is a reliable measure of TEC effectiveness) and to evaluate TEC utilization (scrutinizing this activity as a sole measure of effectiveness).

1. To Improve TEC Use. More activity may be needed, not only in terms of the introduction of TEC to users based on information within the work environment and from training support groups and briefings, but also in terms of a periodically scheduled assessment, both in-house and by outside support groups, of the units' activity to integrate and update TEC into its training schedule. This assessment may be pursued by a more vigorous role in training support groups and briefings, as well as formal schools, to facilitate the adoption of TEC by units. Other research (such as Fairweather's studies

and Davis' research on National Institute of Mental Health projects) reports a need for outside pressure or advocacy from the beginning if the projects are even to be disseminated, much less accepted.

Although initial outside assessments should be considered, the ultimate goal should be to establish an in-house TEC assessment schedule to insure acceptance and utilization of TEC. That is, the acceptance aspect of the adoption process appears to depend more on internally originated information (i.e., within work environment) than on externally originated information (i.e., support groups, etc.). This in-house assessment schedule may be accomplished, for example, by developing a program in which Army training centers would provide the units' training managers, supervisors, and/or operations NCOs with the procedures and information to integrate and update TEC lessons usage. The objective here would be to provide a context that would facilitate a readiness to seek information and knowledge of practice from external sources which would be incorporated within the unit (see Digman, 1977, for more details).

In addition, TEC user meetings could be sponsored that would allow the "frontline" users to discuss their experiences of different utilization plans, problems, adaptations of TEC to their units. The goal here would be to strengthen the interbranch network of communication concerning utilization strategies and to help foster person-to-person communication--two factors reported to be highly influential in the innovation change process (Davis & Glaser, 1976). Moreover, the exchange of information among TEC users could be directed toward a self-renewal capability in which TEC users (e.g., training managers, unit instructors, etc.) would be involved in the modification and upgrading of the content and quality of TEC lessons within their unit, perhaps at company levels. TEC user involvement at this level could be supported by a TEC course development team, located at learning centers or provided from outside support groups. Such an activity has been employed, for example, within a CAI environment at the Ohio State University College of Medicine (Pengov, 1977).

The personal incentive for the unit's personnel involved in the assessment and/or meetings could be official recognition of the person's attempt to integrate and update TEC lesson usage into the training schedule and official documentation in the individual's personnel folder. These suggestions are in support of those of McCluskey et al. (1975) and Mays et al. (1979) that promoted company level involvement in learning how to use TEC, TEC learning center involvement in training unit trainers in TEC, promotion points for both the student and unit trainer, and greater command emphasis.

2. To Evaluate TEC-Related MOS Performance. MOS performance data and other relevant variables should be continued to be collected, as well as TEC lesson usage rates per unit, in order to observe long-term trends. These trends may then be analyzed in terms of determining the optimal mix of TEC integration with conventional/other training based on selected measures of MOS performance. That is, TEC utilization alone may produce a diminishing rate of return when maximum level of MOS performance is reached. Therefore, alternative mixes of TEC usage and conventional and/or other types of training methods could be considered as TEC evaluation continues.

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APPENDIX

TRAINING TECHNOLOGY TRANSFER (T^3)

PT 5146

DATA REQUIRED BY THE PRIVACY ACT OF 1974
(5 U.S.C. 552a)

TITLE OF FORM	PRESCRIBING DIRECTIVE
PT 5146, Training Technology Transfer (T^3)	AR 70-1

1. AUTHORITY

10 USC Sec 4503

2. PRINCIPAL PURPOSE(S)

The data collected with the attached form are to be used for research purposes only.

3. ROUTINE USES

This is an experimental personnel data collection form developed by the U.S. Army Research Institute for the Behavioral and Social Sciences pursuant to its research mission as prescribed in AR 70-1. When identifiers (name or Social Security Number) are requested they are to be used for administrative and statistical control purposes only. Full confidentiality of the responses will be maintained in the processing of these data.

4. MANDATORY OR VOLUNTARY DISCLOSURE AND EFFECT ON INDIVIDUAL NOT PROVIDING INFORMATION

Your participation in this research is strictly voluntary. Individuals are encouraged to provide complete and accurate information in the interests of the research, but there will be no effect on individuals for not providing all or any part of the information. This notice may be detached from the rest of the form and retained by the individual if so desired.

FORM	Privacy Act Statement - 26 Sep 75

DA Form 4368-R, 1 May 75

TRAINING TECHNOLOGY TRANSFER (T^3) Part 1

Name:

Social Security Number:

Rank:

Date of Rank:

Organization:

Present Job Assignment:

Branch:

Length of time in Organization:

Length of time in present Job Assignment:

Previous assignments in your Organization:

Previous training related assignments:

How frequently do you go on TDY?

List all major military schooling (note if it were a correspondence course):

Questions 1-3 deal with communication patterns. This information is important to this research effort. Therefore, we would appreciate answers to the following questions. The names you enter will be used only to tabulate patterns of communication.

(1) Please list by name, rank and duty position the three friends in your organization you see most often socially.

(a)

(b)

(c)

(2) Please list by name, rank and duty position the three persons you work closest with in your organization.

(a)

(b)

(c)

(3) When you need advice on training problems who are the three people you most frequently turn to? (Please list by name, rank and duty position.)

(a)

(b)

(c)

Questions 4-15 deal with the use of TEC lessons as presented on the Beseler Que/See in your unit's training program.

(4) From what source of information did you first learn of TEC lessons?

(a) _____

(b) I am not familiar with TEC (turn in 1st part of questionnaire).

(5) How frequently do you use TEC?

(a) Never

(b) Daily

(c)

(6) What source of information convinced you to use TEC?

(7) From what source of information did you learn how to use TEC?

(8) What subjects do you use TEC lessons to teach?

(9) How many TEC lessons are available in your battalion?

(10) What % of your training time do you use TEC?

(11) If you do not use TEC in your training program--why? (You can circle more than one.)

(a) it is not an effective teaching device
(b) do not have time
(c) do not have manpower
(d) did not receive training on how to use
(e) did not receive TEC lessons
(f) did not receive equipment
(g) equipment is not available to me
(h) non-availability of appropriate lessons
(i)

(12) Under ideal circumstances what is the percentage of your training time that you would use TEC?

(13) Under ideal circumstances what is the <u>minimal</u> percentage of your training time that you would use TEC?

(14) Under ideal circumstances what is the <u>maximal</u> percentage of your training time that you would use TEC?

(15) Please rate the value of TEC relative to traditional instruction for the same subject using the following scale. Mark the point and indicate the value below the scale.

much worse		worse		the same as traditional instruction		better		much better
-50	-40 -30 -20 -10		0	10 20 30 40				50

TRAINING TECHNOLOGY TRANSFER (T^3) Part 2

Name:

Social Security Number:

Each of the following concepts is followed by 10 identical sets of adjective pairs. Each adjective pair is separated by a seven-point scale. Please rate your attitude toward each of the concepts by placing an X along the seven-point scale. Place the X on the line which represents the scale position corresponding to your assessment of the concept relative to that pair of adjectives. The direction you choose left or right of the center of the scale indicates whether you think the concept is more nearly associated with one or the other of the two descriptive adjectives. A mark in the middle indicates that you believe that the concept is midway with respect to the two qualities described in the adjective pairs.

If you are totally unfamiliar with a concept please place the symbol N/A next to the concept.

1. TEC lessons

good	_____	_____	_____	_____	_____	_____	bad
rough	_____	_____	_____	_____	_____	_____	smooth
honest	_____	_____	_____	_____	_____	_____	dishonest
passive	_____	_____	_____	_____	_____	_____	active
fair	_____	_____	_____	_____	_____	_____	unfair
weak	_____	_____	_____	_____	_____	_____	strong
fast	_____	_____	_____	_____	_____	_____	slow
unpleasant	_____	_____	_____	_____	_____	_____	pleasant
hard	_____	_____	_____	_____	_____	_____	soft
worthless	_____	_____	_____	_____	_____	_____	valuable

2. Sony Rover Television Trainer (TVT)

good	_____	_____	_____	_____	_____	_____	bad
rough	_____	_____	_____	_____	_____	_____	smooth
honest	_____	_____	_____	_____	_____	_____	dishonest
passive	_____	_____	_____	_____	_____	_____	active
fair	_____	_____	_____	_____	_____	_____	unfair
weak	_____	_____	_____	_____	_____	_____	strong
fast	_____	_____	_____	_____	_____	_____	slow
unpleasant	_____	_____	_____	_____	_____	_____	pleasant
hard	_____	_____	_____	_____	_____	_____	soft
worthless	_____	_____	_____	_____	_____	_____	valuable

3. ARTEP

good	_____	_____	_____	_____	_____	_____	bad
rough	_____	_____	_____	_____	_____	_____	smooth
honest	_____	_____	_____	_____	_____	_____	dishonest
passive	_____	_____	_____	_____	_____	_____	active
fair	_____	_____	_____	_____	_____	_____	unfair
weak	_____	_____	_____	_____	_____	_____	strong
fast	_____	_____	_____	_____	_____	_____	slow
unpleasant	_____	_____	_____	_____	_____	_____	pleasant
hard	_____	_____	_____	_____	_____	_____	soft
worthless	_____	_____	_____	_____	_____	_____	valuable

4. Performance Oriented Training

good	_____	_____	_____	_____	_____	_____	bad
rough	_____	_____	_____	_____	_____	_____	smooth
honest	_____	_____	_____	_____	_____	_____	dishonest
passive	_____	_____	_____	_____	_____	_____	active
fair	_____	_____	_____	_____	_____	_____	unfair
weak	_____	_____	_____	_____	_____	_____	strong
fast	_____	_____	_____	_____	_____	_____	slow
unpleasant	_____	_____	_____	_____	_____	_____	pleasant
hard	_____	_____	_____	_____	_____	_____	soft
worthless	_____	_____	_____	_____	_____	_____	valuable

5. Pride of workmanship

good	_____	_____	_____	_____	_____	_____	bad
rough	_____	_____	_____	_____	_____	_____	smooth
honest	_____	_____	_____	_____	_____	_____	dishonest
passive	_____	_____	_____	_____	_____	_____	active
fair	_____	_____	_____	_____	_____	_____	unfair
weak	_____	_____	_____	_____	_____	_____	strong
fast	_____	_____	_____	_____	_____	_____	slow
unpleasant	_____	_____	_____	_____	_____	_____	pleasant
hard	_____	_____	_____	_____	_____	_____	soft
worthless	_____	_____	_____	_____	_____	_____	valuable

6. Positive social interaction with peers

good	_____	_____	_____	_____	_____	_____	bad
rough	_____	_____	_____	_____	_____	_____	smooth
honest	_____	_____	_____	_____	_____	_____	dishonest
passive	_____	_____	_____	_____	_____	_____	active
fair	_____	_____	_____	_____	_____	_____	unfair
weak	_____	_____	_____	_____	_____	_____	strong
fast	_____	_____	_____	_____	_____	_____	slow
unpleasant	_____	_____	_____	_____	_____	_____	pleasant
hard	_____	_____	_____	_____	_____	_____	soft
worthless	_____	_____	_____	_____	_____	_____	valuable

7. ability to influence unit policy

good	_____	_____	_____	_____	_____	_____	bad
rough	_____	_____	_____	_____	_____	_____	smooth
honest	_____	_____	_____	_____	_____	_____	dishonest
passive	_____	_____	_____	_____	_____	_____	active
fair	_____	_____	_____	_____	_____	_____	unfair
weak	_____	_____	_____	_____	_____	_____	strong
fast	_____	_____	_____	_____	_____	_____	slow
unpleasant	_____	_____	_____	_____	_____	_____	pleasant
hard	_____	_____	_____	_____	_____	_____	soft
worthless	_____	_____	_____	_____	_____	_____	valuable

8. training trainers "how to train"

good	_____	_____	_____	_____	_____	_____	bad
rough	_____	_____	_____	_____	_____	_____	smooth
honest	_____	_____	_____	_____	_____	_____	dishonest
passive	_____	_____	_____	_____	_____	_____	active
fair	_____	_____	_____	_____	_____	_____	unfair
weak	_____	_____	_____	_____	_____	_____	strong
fast	_____	_____	_____	_____	_____	_____	slow
unpleasant	_____	_____	_____	_____	_____	_____	pleasant
hard	_____	_____	_____	_____	_____	_____	soft
worthless	_____	_____	_____	_____	_____	_____	valuable

9. lecture method for large groups

good	_____	_____	_____	_____	_____	_____	_____	bad
rough	_____	_____	_____	_____	_____	_____	_____	smooth
honest	_____	_____	_____	_____	_____	_____	_____	dishonest
passive	_____	_____	_____	_____	_____	_____	_____	active
fair	_____	_____	_____	_____	_____	_____	_____	unfair
weak	_____	_____	_____	_____	_____	_____	_____	strong
fast	_____	_____	_____	_____	_____	_____	_____	slow
unpleasant	_____	_____	_____	_____	_____	_____	_____	pleasant
hard	_____	_____	_____	_____	_____	_____	_____	soft
worthless	_____	_____	_____	_____	_____	_____	_____	valuable

10. training simulators (e.g., sub-calibre devices)

good	_____	_____	_____	_____	_____	_____	_____	bad
rough	_____	_____	_____	_____	_____	_____	_____	smooth
honest	_____	_____	_____	_____	_____	_____	_____	dishonest
passive	_____	_____	_____	_____	_____	_____	_____	active
fair	_____	_____	_____	_____	_____	_____	_____	unfair
weak	_____	_____	_____	_____	_____	_____	_____	strong
fast	_____	_____	_____	_____	_____	_____	_____	slow
unpleasant	_____	_____	_____	_____	_____	_____	_____	pleasant
hard	_____	_____	_____	_____	_____	_____	_____	soft
worthless	_____	_____	_____	_____	_____	_____	_____	valuable

11. myself as a squad leader

good	_____	_____	_____	_____	_____	_____	_____	bad
rough	_____	_____	_____	_____	_____	_____	_____	smooth
honest	_____	_____	_____	_____	_____	_____	_____	dishonest
passive	_____	_____	_____	_____	_____	_____	_____	active
fair	_____	_____	_____	_____	_____	_____	_____	unfair
weak	_____	_____	_____	_____	_____	_____	_____	strong
fast	_____	_____	_____	_____	_____	_____	_____	slow
unpleasant	_____	_____	_____	_____	_____	_____	_____	pleasant
hard	_____	_____	_____	_____	_____	_____	_____	soft
worthless	_____	_____	_____	_____	_____	_____	_____	valuable

12. myself as a platoon leader

good	_____	_____	_____	_____	_____	_____	_____	bad
rough	_____	_____	_____	_____	_____	_____	_____	smooth
honest	_____	_____	_____	_____	_____	_____	_____	dishonest
passive	_____	_____	_____	_____	_____	_____	_____	active
fair	_____	_____	_____	_____	_____	_____	_____	unfair
weak	_____	_____	_____	_____	_____	_____	_____	strong
fast	_____	_____	_____	_____	_____	_____	_____	slow
unpleasant	_____	_____	_____	_____	_____	_____	_____	pleasant
hard	_____	_____	_____	_____	_____	_____	_____	soft
worthless	_____	_____	_____	_____	_____	_____	_____	valuable

13. myself as a company commander

good	_____	_____	_____	_____	_____	_____	bad
rough	_____	_____	_____	_____	_____	_____	smooth
honest	_____	_____	_____	_____	_____	_____	dishonest
passive	_____	_____	_____	_____	_____	_____	active
fair	_____	_____	_____	_____	_____	_____	unfair
weak	_____	_____	_____	_____	_____	_____	strong
fast	_____	_____	_____	_____	_____	_____	slow
unpleasant	_____	_____	_____	_____	_____	_____	pleasant
hard	_____	_____	_____	_____	_____	_____	soft
worthless	_____	_____	_____	_____	_____	_____	valuable

14. myself as a battalion commander

good	_____	_____	_____	_____	_____	_____	bad
rough	_____	_____	_____	_____	_____	_____	smooth
honest	_____	_____	_____	_____	_____	_____	dishonest
passive	_____	_____	_____	_____	_____	_____	active
fair	_____	_____	_____	_____	_____	_____	unfair
weak	_____	_____	_____	_____	_____	_____	strong
fast	_____	_____	_____	_____	_____	_____	slow
unpleasant	_____	_____	_____	_____	_____	_____	pleasant
hard	_____	_____	_____	_____	_____	_____	soft
worthless	_____	_____	_____	_____	_____	_____	valuable

15. myself as a brigade commander

good	_____	_____	_____	_____	_____	_____	bad
rough	_____	_____	_____	_____	_____	_____	smooth
honest	_____	_____	_____	_____	_____	_____	dishonest
passive	_____	_____	_____	_____	_____	_____	active
fair	_____	_____	_____	_____	_____	_____	unfair
weak	_____	_____	_____	_____	_____	_____	strong
fast	_____	_____	_____	_____	_____	_____	slow
unpleasant	_____	_____	_____	_____	_____	_____	pleasant
hard	_____	_____	_____	_____	_____	_____	soft
worthless	_____	_____	_____	_____	_____	_____	valuable

16. 'self as commanding general of a division

good	_____	_____	_____	_____	_____	_____	bad
rough	_____	_____	_____	_____	_____	_____	smooth
honest	_____	_____	_____	_____	_____	_____	dishonest
passive	_____	_____	_____	_____	_____	_____	active
ir	_____	_____	_____	_____	_____	_____	unfair
eak	_____	_____	_____	_____	_____	_____	strong
fast	_____	_____	_____	_____	_____	_____	slow
unpleasant	_____	_____	_____	_____	_____	_____	pleasant
hard	_____	_____	_____	_____	_____	_____	soft
worthless	_____	_____	_____	_____	_____	_____	valuable

17. on duty education (GED)

good	_____	_____	_____	_____	_____	_____	_____	bad
rough	_____	_____	_____	_____	_____	_____	_____	smooth
honest	_____	_____	_____	_____	_____	_____	_____	dishonest
passive	_____	_____	_____	_____	_____	_____	_____	active
fair	_____	_____	_____	_____	_____	_____	_____	unfair
weak	_____	_____	_____	_____	_____	_____	_____	strong
fast	_____	_____	_____	_____	_____	_____	_____	slow
unpleasant	_____	_____	_____	_____	_____	_____	_____	pleasant
hard	_____	_____	_____	_____	_____	_____	_____	soft
worthless	_____	_____	_____	_____	_____	_____	_____	valuable

18. Women in the Army

good	_____	_____	_____	_____	_____	_____	_____	bad
rough	_____	_____	_____	_____	_____	_____	_____	smooth
honest	_____	_____	_____	_____	_____	_____	_____	dishonest
passive	_____	_____	_____	_____	_____	_____	_____	active
fair	_____	_____	_____	_____	_____	_____	_____	unfair
weak	_____	_____	_____	_____	_____	_____	_____	strong
fast	_____	_____	_____	_____	_____	_____	_____	slow
unpleasant	_____	_____	_____	_____	_____	_____	_____	pleasant
hard	_____	_____	_____	_____	_____	_____	_____	soft
worthless	_____	_____	_____	_____	_____	_____	_____	valuable

19. SQT

good	_____	_____	_____	_____	_____	_____	_____	bad
rough	_____	_____	_____	_____	_____	_____	_____	smooth
honest	_____	_____	_____	_____	_____	_____	_____	dishonest
passive	_____	_____	_____	_____	_____	_____	_____	active
fair	_____	_____	_____	_____	_____	_____	_____	unfair
weak	_____	_____	_____	_____	_____	_____	_____	strong
fast	_____	_____	_____	_____	_____	_____	_____	slow
unpleasant	_____	_____	_____	_____	_____	_____	_____	pleasant
hard	_____	_____	_____	_____	_____	_____	_____	soft
worthless	_____	_____	_____	_____	_____	_____	_____	valuable

20. Engagement Simulation (SCOPES, REALTRAIN)

good	_____	_____	_____	_____	_____	_____	_____	bad
rough	_____	_____	_____	_____	_____	_____	_____	smooth
honest	_____	_____	_____	_____	_____	_____	_____	dishonest
passive	_____	_____	_____	_____	_____	_____	_____	active
fair	_____	_____	_____	_____	_____	_____	_____	unfair
weak	_____	_____	_____	_____	_____	_____	_____	strong
fast	_____	_____	_____	_____	_____	_____	_____	slow
unpleasant	_____	_____	_____	_____	_____	_____	_____	pleasant
hard	_____	_____	_____	_____	_____	_____	_____	soft
worthless	_____	_____	_____	_____	_____	_____	_____	valuable

21. Training innovations save time and manpower

good	_____	_____	_____	_____	_____	_____	_____	bad
rough	_____	_____	_____	_____	_____	_____	_____	smooth
honest	_____	_____	_____	_____	_____	_____	_____	dishonest
passive	_____	_____	_____	_____	_____	_____	_____	active
fair	_____	_____	_____	_____	_____	_____	_____	unfair
weak	_____	_____	_____	_____	_____	_____	_____	strong
fast	_____	_____	_____	_____	_____	_____	_____	slow
unpleasant	_____	_____	_____	_____	_____	_____	_____	pleasant
hard	_____	_____	_____	_____	_____	_____	_____	soft
worthless	_____	_____	_____	_____	_____	_____	_____	valuable

22. TASO

good	_____	_____	_____	_____	_____	_____	_____	bad
rough	_____	_____	_____	_____	_____	_____	_____	smooth
honest	_____	_____	_____	_____	_____	_____	_____	dishonest
passive	_____	_____	_____	_____	_____	_____	_____	active
fair	_____	_____	_____	_____	_____	_____	_____	unfair
weak	_____	_____	_____	_____	_____	_____	_____	strong
fast	_____	_____	_____	_____	_____	_____	_____	slow
unpleasant	_____	_____	_____	_____	_____	_____	_____	pleasant
hard	_____	_____	_____	_____	_____	_____	_____	soft
worthless	_____	_____	_____	_____	_____	_____	_____	valuable

23. Performance Oriented Training is a new name for the same old thing.

good	_____	_____	_____	_____	_____	_____	_____	bad
rough	_____	_____	_____	_____	_____	_____	_____	smooth
honest	_____	_____	_____	_____	_____	_____	_____	dishonest
passive	_____	_____	_____	_____	_____	_____	_____	active
fair	_____	_____	_____	_____	_____	_____	_____	unfair
weak	_____	_____	_____	_____	_____	_____	_____	strong
fast	_____	_____	_____	_____	_____	_____	_____	slow
unpleasant	_____	_____	_____	_____	_____	_____	_____	pleasant
hard	_____	_____	_____	_____	_____	_____	_____	soft
worthless	_____	_____	_____	_____	_____	_____	_____	valuable

Thank you for your participation.

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